

Remarks

Claims 1 - 7 have been pending and were rejected in a first office action. After the present amendment, claims 1 - 4 and 6 - 13 are pending. New claims 8-13 recite additional desirable features. The recitation "cation comprising at least one five or six-membered heterocycle containing at least one phosphorus or nitrogen atom," which has been added to claim 8 is supported by the specification throughout, for example on page 2, lines 32-36. The term "removing polar, low boiling compounds by evaporation" in claim 11 is supported, for example by the specification, page 11, lines 11-12. The term "water, methanol, ethanol, 1-propanol, isopropanol or a mixture thereof is used as solvent" in claim 12 is supported, for example by amended claim 6. The term "anion is a halide" from claim 13 is supported, for example, by line 23 of page 10. Accordingly, no new matter has been added and entry of the amendments courteously is requested.

Rejection on 112, 2nd paragraph grounds

Claim 5 was rejected on indefiniteness grounds over the use of "high boiling compounds" in this claim. However, when read in the context of the specification, this term is clear to a skilled artisan. The specification explains that, while "low-boiling components are separated off by simple evaporation..." (p. 11 lines 11-12), it is the "nonpolar high boilers which readily dissolve in nonpolar (organic) solvents" and the polar high boilers are problematic in previous procedures (p. 11 lines 26-30). While claim 5 has been cancelled, this term has been added to claim 1 and to claim 8.

Applicants stress that the polar high boiling compounds are difficult to separate from ionic liquid. As mentioned, the low boiling compounds may be separated by evaporation and the non-polar high boiling compounds may be separated by extraction with a non-polar solvent. The non-polar solvent (e.g. heptane) does not mix with the ionic fluid. For the polar compounds, however, a polar solvent generally would be necessary, but this tends to mix with the ionic fluid, which complicates extraction. Adsorption separation is used for the polar high boiling compounds.

Applicants point out that a skilled artisan understands this passage and both appreciates this described advantage of the claimed invention as well as the types of compounds, which do not readily separate from ionic fluids by simple evaporation. The recent Federal Circuit Philips v. AWH Corporation case of 2005 makes clear that a construer will "rely heavily on the written description for guidance as to the meaning of the claims." In this instance, the context of a problem alleviated by this claimed invention feature and the associated text reveals a more specific meaning of "high boiling compounds" than a technical dictionary would.

Reconsideration and allowance respectfully are requested.

Rejection on 102 and 103 grounds

Earle: Claims 1-3 have been rejected over Earle on anticipation and obviousness grounds. Claims 2 and 7 have been rejected over Earle in view of Snyder on obviousness

grounds. Claim 4 has been rejected over Earle in view of Gerhold on obviousness grounds.

The amended claims recite "polar, high boiling compound" and claim 13 recites "the anion is a halide."

Earle teaches something different: separation of a negatively charged aromatic from the ionic liquid. The ionic liquid preferably is made of a dialkylimidazolium cation (paragraph 10) with "preferably a sulfur-containing anion" (paragraph 11). Thus, Earle now differs from the amended claims in several ways. One, Earle separates an anionic molecule, not a polar, high boiling compound. Two, Earle does not specifically teach contact of the fluid with an absorbent followed by removal of the absorbent. Also, Earle does not describe any particular separation but refers generally to "physical or chemical means such as distillation, steam distillation,...and chromatography." If anything, Earle leads a reader to boil off undesired compounds, by this terse description, in direct contradiction to a discovery and claims of the present case.

Even the chemical agents, (a specific cation for the ionic fluid, toluene, and sulfur containing anion), which are taught as preferred, are directed to their use in the oxidation reaction. This description of an oxidation reaction without any details of a purification process does not provide any motivation to the reader to select an absorption process for removing a polar high boiling compound.

Because Earle does not teach separation of a "polar, high boiling compound," a prima facie case of obviousness does not exist for these amended claims. Claims 8-13, which recite this feature, additionally recite a two step process "a first step of contacting the fluid with a resin, and a second step of separating the ionic fluid from the resin" and a prima facie case of obviousness is lacking for the new claims as well.

Reconsideration and allowance respectfully are requested.

Fields: Claims 1, 2 and 7 have been rejected over Fields on anticipation and obviousness grounds. However, Fields focuses on and teaches a "method of removing from a metal salt ionic species," not polar high boiling compounds (see abstract). The amended claims recite "polar, high boiling compound." Claims 8-13, which recite this feature, additionally recite a two step process "a first step of contacting the fluid with a resin, and a second step of separating the ionic fluid from the resin" and a prima facie case of obviousness is lacking for the new claims as well.

Reconsideration and allowance are requested.

Wasserscheid: Claims 1-7 have been rejected over Wasserscheid on anticipation and obviousness grounds. However, Wasserscheid also focuses on the separation of a negatively charged aromatic from the ionic liquid (e.g. p. 18 second paragraph, first two lines of 3rd paragraph) and not on a "polar, high boiling compound" as now recited in the amended claims. Furthermore, to the extent that Wasserscheid discusses polar

contaminants, Wasserscheid emphasizes that "the impurity likely to be present in largest concentrations in most ionic liquids is water," which is removed by a non-absorptive process. Thus, Wasserscheid tends to lead away from the claimed invention.

Reconsideration of the amended claims in view of these arguments, and allowance are requested.

Entry of the claim amendments, reconsideration and allowance of amended claims earnestly are requested. If a telephonic interview can facilitate disposition of this case, the Examiner cordially is requested to contact the undersigned attorney at 202-659-0100.

Respectfully submitted,



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